

IN THE CLAIMS

1- 41 (Canceled)

42. (Currently amended) An apparatus for treating tissue or organs for producing cell electroporation, said apparatus comprising:

a plurality of electrodes arranged in an electrode applicator adapted for placement within a restricted region of the tissue or organ,

a high voltage generator arranged to generate and deliver one or more high voltage pulses to said plurality of electrodes to produce cell electroporation of tissue or organs,

an impedance measuring means arranged between the plurality of electrodes for measuring impedance within said restricted region, at at least one of before, during and after application of said one or more high voltage pulses, at at least one frequency, and

a registration and conversion means, arranged between said high voltage generator and said impedance measuring means for receiving signals from the impedance measuring means and emitting signals to the high voltage generator to control the pulses produced thereby based on the impedance measured in said restricted region and thereby control the cell electroporation of the tissue or organ.

43. (Previously Presented) The apparatus according to claim 42, wherein said high voltage generator generates the high voltage pulses at a value high enough to produce cell

electroporation.

44. (Previously Presented) The apparatus according to claim 42, wherein the registration and conversion means correlates impedance measurements with a degree of electroporation of cells in the tissue or organs and emits signals to the high voltage generator to adjust or terminate the pulses when a desired treatment effect is obtained.

45. (Previously Presented) The apparatus according to claim 44, wherein the registration and conversion means emits signals to the high voltage generator during the pulses to adjust the pulses so that a predetermined field strength in the tissue or organs is obtained.

46. (Previously Presented) The apparatus according to claim 44, wherein said one or more high voltage pulses has a pulse length of approximately 0.1 to 200 ms.

47. (Previously Presented) The apparatus according to claim 46, wherein the impedance measuring means measures at frequencies within the range of 10 Hz to 10 MHz.

48. (Previously Presented) The apparatus according to claim 47, wherein the impedance measuring means measures at frequencies within the range of 40 Hz to 2 MHz.

49. (Previously Presented) The apparatus according to claim 47 48, wherein the impedance measuring means measures at frequencies within the range of 10 Hz-200kHz.

50. (Previously Presented) The apparatus according to claim 49, wherein the impedance measuring means measures at frequencies within the range of 40 Hz to 100 kHz.

51. (Previously Presented) The apparatus according to claim 50, wherein the impedance measuring means measures at frequencies within the range of 100 Hz to 10 kHz.

52. (Currently Amended) The apparatus according to claim 42 ~~51~~, wherein said one or more high voltage pulses is set to a repetition frequency of approximately 0.1 to 10000 cycles per second.

53. (Previously Presented) The apparatus according to claim 52, wherein said one or more pulses has an amplitude of approximately 50 to 6000 V.

54. (Previously Presented) The apparatus according to claim 53, wherein said one or more pulses is selected from the group consisting of mono-polar square wave pulses, mono-polar exponential decaying pulses, bipolar square wave pulses, bipolar exponential decaying pulses and sinusoidal bipolar pulse trains.

55. (Previously Presented) The apparatus according to claim 54, further comprising sensors arranged to detect electric fields formed by the electrodes connected to the registration and conversion means to measure magnitude of the electric field.

56. (Previously Presented) The apparatus according to claim 55, further comprising

sensors arranged to detect the distance between the electrodes connected to said registration and converter means which adjust the voltage between said electrodes based on the detected distance between the electrodes.

57. (Previously Presented) The apparatus according to claim 56, wherein the registration and conversion means is a computer.

58. (Previously Presented) The apparatus according to claim 57, wherein the registration and conversion means is a microprocessor.

59. (Previously Presented) The apparatus according to claim 58, wherein said electrodes are respectively connected to one or both of said voltage generator and said impedance measuring means.

60. (Currently Amended) The apparatus according to claim ~~42~~ 59, further comprising means for supplying at least one therapeutic substance, genetic material and ionizing radiation to said tissue or organ.

61. (Currently Amended) The apparatus according to claim ~~42~~ 60, wherein said electrodes are in the form of needles or stiletos.

62. (Previously Presented) The apparatus according to claim 61, wherein said electrodes are surrounded by an electrically insulating layer.

63. (Currently Amended) The apparatus according to claim 42 ~~62~~, wherein said electrode applicator includes a fixture arranged to position the electrodes.

64. (Previously Presented) The apparatus according to claim 63, wherein said fixture is provided with a number of holes arranged to place the electrodes in a desired pattern.

Claims 65 - 69 (cancelled)

70. (Previously Presented) An apparatus for treating tissue or organs, said apparatus comprising:

a plurality of electrodes arranged for placement within a restricted region of the tissue or organ to be treated,

a high voltage generator arranged to generate and deliver one or more high voltage pulses to said plurality of electrodes,

an impedance measuring means arranged between the plurality of electrodes for measuring impedance of the restricted region, at at least one of before, during and after application of said one or more high voltage pulses, at at least one frequency, and

a registration and conversion means, communicating with said high voltage generator and said impedance measuring means for receiving, storing, and comparing impedance measurements from the impedance measuring means and for controlling the high voltage generator such that the high voltage pulses to be delivered to said plurality of electrodes produces a constant electric field within the restricted region.

71. (Currently Amended) A method for implementation in an apparatus for treating tissue or organs having a plurality of electrodes adapted for placement within a restricted region of the tissue or organ, a high voltage generator arranged to generate one or more high voltage pulses to said plurality of electrodes, an impedance measuring unit arranged between the plurality of electrodes to measure impedance before, during and after application of said one or more high voltage pulses at at least one frequency ~~a plurality of frequencies~~, and a registration and conversion device communicating with said impedance measuring unit and said high voltage generator to receive impedance measurements measured by the impedance measuring unit and to control said high voltage generator, said method comprising the steps of:

receiving an initial impedance measurement measured by the impedance measuring unit before, during or after the one of more high voltage pulses are ~~to~~ be generated by the high voltage generator,

storing the impedance measurements received in the step of receiving an initial impedance measurement,

emitting an initial control signal to the high voltage generator to generate a high voltage pulse based on the impedance measurement received in the step of receiving an initial impedance measurement,

receiving an intermediate impedance measurement measured by the impedance measuring unit before, during or after the one or more high voltage pulses are ~~to be~~ generated by the high voltage generator,

storing the impedance measurement received in the step of receiving an intermediate impedance measurement,

obtaining an assessment by assessing effects of the one or more high voltage pulses generated by the high voltage generator by comparing the initial impedance measurement stored in the step of storing the initial impedance measurement and the intermediate impedance measurement stored in the step of storing the intermediate impedance measurement, and

emitting a signal to the high voltage generator to adjust or terminate the high voltage pulses base on the assessment obtained in the step of obtaining an assessment.

72. (Previously Presented) The method according to claim 71, wherein the impedance is measured at a plurality of frequencies and the application of high voltage pulses is terminated after values of impedance at said plurality of frequencies reaches a constant value.

73. (Previously Presented) The method according to claim 72, wherein a medical treatment substance is introduced into the body prior to application of high voltage pulses or after the registration and conversion device has terminated the application of high voltage pulses.

74. (Cancelled)

75. (Previously Presented) The method according to claim 71, wherein the high voltage is applied for a short period of about 32 pulses.

76. (Previously Presented) The apparatus according to claim 42, wherein said registration

and conversion means compares impedance measurements from the impedance measuring means to control the high voltage generator such that the high voltage pulses to be delivered to said plurality of electrodes produce a constant electric field within the restricted region.

77. (Previously Presented) A method in which the apparatus of claim 42 is used and comprises the steps of:

receiving an initial impedance measurement measured by the impedance measuring means before the one of more high voltage pulses to be generated by the high voltage generator,

storing the impedance measurements received in the step of receiving an initial impedance measurement,

emitting an initial control signal to the high voltage generator to generate a high voltage pulse based on the impedance measurement received in the step of receiving an initial impedance measurement,

receiving an intermediate impedance measurement measured by the impedance measuring means during the one or more high voltage pulses to be generated by the high voltage generator,

storing the impedance measurement received in the step of receiving an intermediate impedance measurement,

obtaining an assessment by assessing effects of the one or more high voltage pulses generated by the high voltage generator by comparing the initial impedance measurement stored in the step of storing the initial impedance measurement and the intermediate impedance measurement stored in the step of storing the intermediate

impedance measurement, and

emitting a signal to the high voltage generator to adjust or terminate the high voltage pulses based on the assessment obtained in the step of obtaining an assessment.

78. (Original) The method according to claim 77, wherein the impedance is measured at a plurality of frequencies and the application of high voltage pulses is terminated after values of impedance at said plurality of frequencies reaches a constant value.

79. (Previously Presented) The method according to claim 78, wherein a medical treatment substance is introduced into the body prior to application of high voltage pulses or after the registration and conversion means has terminated the application of high voltage pulses.

80. (Cancelled)

81. (Original) The method according to claim 77, wherein the high voltage is applied for a short period of about 32 pulses.

82. (Previously Presented) The apparatus according to claim 42, wherein said impedance measuring means comprises sensors for application to the tissue or organ within said restricted region.

83. (Previously Presented) The apparatus according to claim 42, wherein the pulses

produced by the high voltage generator are controlled by the registration and conversion means to produce a substantially constant pre-determined electric field in said restricted region of the tissue or organ.

84. (Previously Presented) The apparatus according to claim 42, wherein the impedance measuring means is arranged between the plurality of electrodes for measuring impedance at a plurality of frequencies.

85. (Previously Presented) The apparatus according to claim 70, wherein the impedance measuring means is arranged between the plurality of electrodes for measuring impedance at a plurality of frequencies.